1. (amended) A packet-switched multiple-access network system having a shared communication channel connecting a plurality of stations, each station comprising:

a network interface, the network interface transmitting packets to the shared communication channel and receiving packets from the shared communication channel;

a carrier sense for sensing whether the shared communication channel is in use and for preventing transmissions by the station when the shared communication channel is in use;

a collision detect for detecting the occurrence of a collision between a first transmission by the station and a second transmission on the shared communication channel, and for causing a collision notification signal to be transmitted to the shared communication channel by the station when a collision is detected;

a slot timer for dividing a time period following successful completion of a transmission on the shared communication channel into a plurality of contention slots in order of priority;

a controller for monitoring a priority of a data packet awaiting transmission and for delaying transmission of the data packet awaiting transmission until a contention slot corresponding to the priority of the data packet;

wherein, when the station detects a collision of the data packet in a contention slot, the station enters a contention protocol to resolve the collision between contending stations for that contention slot; and

wherein, when the station receives a collision notification signal from the shared communication channel and the station was not involved in the collision, the station reduces the priority of the data packet awaiting transmission so as to withhold transmission until completion of the contention protocol between contending stations.

7. (amended) The system as in Claim 1, wherein the contention protocol includes dividing a time interval following a collision into a plurality of signal slots.

9. (amended) The system as in Claim 7, wherein the signal slots are used for signaling opportunities for contending stations to share information for the contention protocol implemented using a tree or stack-based collision resolution technique.

10. (amended) The system as in Claim 7, wherein each contending station which has entered the contention protocol pseudo-randomly selects one of the plurality of signal slots, and signals that selection by transmitting a signal onto the shared communication channel in the selected signal slot.

11. (amended) The system as in Claim 7, wherein the controller for monitoring the priority of the data packet awaiting transmission further comprises:

a first stack that indicates a priority level of contending stations;

a second stack that indicates the priority of the data packet awaiting transmission; and

control logic for incrementing and decrementing the second stack based on at least one of: (a) a carrier sense signal; (b) a collision detect signal; (c) a collision notification signal; and (d) a transmitted signal in a signal slot.

12. (amended) The system as in Claim 11, wherein the first stack is used to initialize the second stack when the station has prepared a new packet for transmission.

14. (amended) The system as in Claim 9, wherein a pattern of selection of signal slots by a station in the contention protocol conveys side-band signaling information to other stations, whereby the selection of signal slots is used to specify a subordinate level of priority within the priority level associated with the contention protocol.

18. (amended) The system as in Claim 1, wherein the collision notification signal has a duration of transmission interval that is distinguishable from the range of transmission intervals used by non-colliding transmissions.

19. The system as in Claim 18, wherein the first station simulates a collision by forcing its transmission to have a duration that falls within the predetermined interval defined for collisions.

25. (amended) A channel signal transmitted over a packet-switched multiple-access network, the channel signal comprising:

a collision notification signal for indicating a collision of transmissions by contending stations in a contention slot, and for causing non-contending stations connected to the network to delay transmission for a period sufficient to allow resolution of the collision between the contending stations;

at least one collision resolution signal after the collision notification signal, the collision resolution signal occurring a predetermined period after the collision notification signal so as to fall within one of a plurality of signal slots;

a data packet transmission signal after the at least one collision resolution signal, the data packet transmission signal occurring a predetermined period after the collision resolution signal so as to fall within one of a plurality of contention slots, each

contention slot having a unique priority to provide multiple levels of priority of access.

26. (amended) The channel signal as in claim 25, wherein the collision resolution signal is used to share information between stations used for collision resolution.

27. (amended) The channel signal as in Claim 25, further comprising:

side-band signaling at the MAC layer, the side-band signaling providing information for the PHY (physical) layer; and

a deterministic label indicator slot for indicating that a pattern of votes by a station in the signal slots is the result of the station intending to convey side-band signaling information for the PHY layer.

28. (amended) The channel signal as in Claim 25, further comprising:

a HOLDOFF period between the plurality of signal slots and the plurality of contention slots, the HOLDOFF period being used to suspend the collision resolution between contending stations for a predetermined time interval such that the predetermined time interval can be used for access by a third station that is not executing the collision resolution protocol.

29. (amended) A method for a packet-switched multiple-access network, the method comprising:

transmitting packets to a shared communication channel and receiving packets from the channel;

sensing whether the channel is in use and preventing transmissions when the channel is in use;

detecting the occurrence of a collision on the channel between a first transmission and a second transmission;

transmitting a collision notification signal to the channel when a collision is detected;

dividing a time period following successful completion of a transmission on the channel into a plurality of contention slots in order of priority;

delaying transmission of a first data packet awaiting transmission until a contention slot corresponding to the priority of the first data packet awaiting transmission;

upon detection of a collision in a contention slot, entering a contention protocol to resolve the collision between contending stations for that contention slot; and

when a second data packet awaiting transmission was not involved in a collision detected in a contention slot, reducing a priority of the second data packet awaiting transmission so as to withhold transmission of the second data packet until completion of the contention protocol between contending stations.

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36. (amended) The method as in Claim 29, wherein the signal slots are used for signaling opportunities for the first station to share information with other stations which are connected to the channel, used for the contention protocol.

37. (amended) The method as in Claim 36, wherein the contention protocol is implemented using a tree or stack-based collision resolution technique.

38. (amended) The method as in Claim 36, wherein the contention protocol comprises each station contending for access in a given contention slot pseudo-randomly selecting among the possible signal

slots and signaling that vote by transmitting a signal during the selected signal slot.

39. (amended) The method as in Claim 29, further comprising:

providing a first stack that indicates a priority level of contending stations;

providing a second stack that indicates the priority of the data packet awaiting transmission, and

incrementing and decrementing the second stack based on at least one of: (a) a carrier sense signal; (b) a collision detect signal; (c) a collision notification signal; and (d) a transmitted signal in a signal slot.

40. (amended) The method as in Claim 39, wherein the first stack is used to initialize the second stack when a new packet has been prepared for transmission.

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42. (amended) The method in Claim 29, wherein a pattern of selection of signal slots by a station in the contention protocol conveys side-band signaling information to other stations, whereby the selection of signal slots is used to specify a subordinate level of priority within the priority level associated with the contention protocol.

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45. (amended) The method as in Claim 29, wherein the collision notification signal has a duration of transmission interval that is distinguishable from a transmission interval used by a non-colliding transmission.

46. (amended) The method as in Claim 45, further comprising simulating a collision by forcing a transmission to have a duration that falls within the predetermined duration defined for collisions.

47. (amended) The method as in Claim 34, further comprising:

transmitting a HOLDOFF signal, the HOLDOFF signal being used to suspend the contention protocol for a predetermined time interval such that the predetermined time interval can be used for access by a station that is not executing the contention protocol.

51. (new) The system as in claim 1, wherein following a collision resolution in which at least one contending station reduces a priority of transmission to allow a second contending station to transmit without collision, all non-contending stations reduce a priority of transmission to allow the at least one contending station to transmit without collision following completion of transmission by the second contending station.

52. (new) The system as in claim 7, wherein the contention protocol further includes dividing a time period following the signal slots into a plurality of contention slots arranged in order of priority.

53. (new) The system as in claim 10, wherein upon a collision within a signal slot of signals transmitted by a sub-set of the contending stations, each of the sub-set of contending stations transmits a collision notification signal and recommences a contention protocol, and wherein each contending station not in the sub-set of contending stations reduces the priority of the data packet awaiting transmission so as to withhold transmission until completion of the recommenced contention protocol between the sub-set of contending stations.

54. (new) The carrier wave signal as in claim 25, wherein a time period following the signal slots is divided into a plurality of contentions slots arranged in order of priority.

55. (new) The method as in claim 29, wherein following a collision resolution in which at least one contending station reduces a priority of transmission to allow a second contending station to transmit without collision, all non-contending stations reduce a priority of transmission to allow the at least one contending station to transmit without collision following completion of transmission by the second contending station.

56. (new) The method as in claim 29, wherein the contention protocol further includes dividing a time period following the signal slots into a plurality of contention slots arranged in order of priority.

57. (new) The method as in claim 29, wherein upon a collision within a signal slot of signals transmitted by a sub-set of the contending stations, each of the sub-set of contending stations transmits a collision notification signal and recommences a contention protocol, and wherein each contending station not in the sub-set of contending stations reduces the priority of the data packet awaiting transmission so as to withhold transmission until completion of the recommenced contention protocol between the sub-set of contending stations.

58. (new) A station for connection to a shared communication channel of a packet-switched multiple-access network, the station comprising:

a network interface for transmitting packets to the shared communication channel and receiving packets from the shared communication channel;

a carrier sense for sensing whether the shared communication channel is in use and for preventing transmissions by the station when the shared communication channel is in use;

a collision detect for detecting the occurrence of a collision between a first transmission by the station and a second transmission on the shared communication channel, and for causing a collision notification signal to be transmitted to the shared communication channel by the station when a collision is detected;

a slot timer for dividing a time period following successful completion of a transmission on the shared communication channel into a plurality of contention slots in order of priority;

a controller for monitoring a priority of a data packet awaiting transmission and for delaying transmission of the data packet awaiting transmission until a contention slot corresponding to the priority of the data packet;

wherein, when the station detects a collision of the data packet in a contention slot, the station enters a contention protocol to resolve the collision between contending stations for that contention slot; and

wherein, when the station receives a collision notification signal from the shared communication channel and the station was not involved in the collision, the station reduces the priority of the data packet awaiting transmission so as to withhold transmission until completion of the contention protocol between contending stations.

59. (new) The station as in Claim 58, wherein the contention protocol includes dividing a time interval following a collision into a plurality of signal slots.

60. (new) The station as in Claim 59, wherein the signal slots are used for signaling opportunities for contending stations to share information for the contention protocol implemented using a tree or stack-based collision resolution technique.

61. (new) The station as in Claim 59, wherein each contending station which has entered the contention protocol pseudo-randomly selects one of the plurality of signal slots, and signals that selection by transmitting a signal onto the shared communication channel in the selected signal slot.

62. (new) The station as in Claim 58, wherein the controller for monitoring the priority of the data packet awaiting transmission comprises:

a first stack that indicates a priority level of contending stations;

a second stack that indicates the priority of the data packet awaiting transmission, and

control logic for incrementing and decrementing the second stack based on at least one of: (a) a carrier sense signal; (b) a collision detect signal; (c) a collision notification signal; and (d) a transmitted signal in a signal slot.

63. (new) The station as in Claim 62, wherein the first stack is used to initialize the second stack when the station has prepared a new packet for transmission.

64. (new) The station as in Claim 59, wherein a pattern of selection of signal slots by the station in the contention protocol conveys side-band signaling information to other stations, whereby the selection of signal slots is used to specify a subordinate level of priority within the priority level associated with the contention protocol.

65. (new) The station as in Claim 58, wherein the collision notification signal has a duration of transmission interval that is

distinguishable from the range of transmission intervals used by non-colliding transmissions.

66. (new) The station as in Claim 65, wherein the first station simulates a collision by forcing its transmission to have a duration that falls within the predetermined interval defined for collisions.

67. (new) The channel signal as in Claim 25, wherein at least two collision resolution signals are transmitted in a single signal slot, and further comprising at least one subsidiary collision resolution signal after the at least two collision resolution signals, the at least one subsidiary collision resolution signal occurring a predetermined period after the at least two collision resolution signals so as to fall within one of a plurality of subsidiary signal slots.

68. (new) The channel signal as in claim 67, wherein a pattern of selection of signal slots and subsidiary signal slots within which collision resolution signals and subsidiary collision resolution signals are transmitted represents a tree or stack-based collision resolution technique.

REMARKS

The above identified patent application has been amended. The amendments have been made to claim subject matter of the specification not claimed in parent U.S. Patent No. 6,256,317 and considered patentable over the prior art. Entry of the amendment is hereby requested. No new matter has been added.

Claims 1, 7, 9, 10, 11, 12, 14, 18, 19, 25, 26, 27, 28, 29, 36, 37, 38, 39, 40, 42, 45, 46, 47 and 51 to 68 are now in the application.